TAC-100D

DIVER NAVIGATION BOARD

OPERATIONS MANUAL

RJE International, Inc.

YOUR SOURCE FOR DIVER NAVIGATION AND UNDERWATER RELOCATION EQUIPMENT

WARNING

Diving is a dangerous and potentially life threatening activity. The TAC-100D series diver navigation boards must be used by a person who is certified by a recognized agency (PADI, NAUI, SSI, NASDS, YMCA, etc.). Improper use or misuse of the TAC-100D could result in serious injury or death. Do not use the TAC-100D or any of its components until you have read and fully understand instructions and safety precautions in this manual. Never rely on the TAC-100D as your sole means of underwater navigation. Always have at least one other means of underwater navigation available.

DG100 SPECIFICATIONS

Depth Range	0-330ft (0-100m)
Depth Tolerance	Typically ±2%
Depth Resolution	0.1ft/0.1m
Altitude Compensation	6000ft (1,828m)
Display	Red OLED Display
Dive Timer Tolerance	± 1%
Leg Timer Functions	Start / Pause / Reset
Led Timer Duration	99 hours max
Battery	Rechargeable Lithium Polymer
Battery Life	300 charges
Operational Life	20 hours
Operating Temperature	29°F - 95°F (-2°C - 42°C)
Housing	Aluminum with Injected molded plastic
Depth Rated	330ft (100m)
Dimension	2.15" x 2.15" x 1.15" (55mm x 55mm x 29mm)
Weight in Air	4.8oz (136gr)

By plotting your dives this way, you become much more efficient underwater and can truly optimize your bottom time. If you have to map an underwater site, the TAC-100D becomes a effective tool for the job as well.

TAC100-1 NAVIGATION BOARD

The TAC100-1 Navigation Board is a rugged high impact plastic board that is the base for the TAC-100D Navigation System. The TAC100-2 Underwater Compass and the DG100 are both mounted onto the TAC100-1 to complete the system. The hardware used to mount the TAC100-2 Underwater Compass is made out of non-corrosive material and should provide you with many years of service.

TAC100-2 UNDERWATER COMPASS

The TAC100-2 Underwater Compass is designed and manufactured for the rigors of underwater use. The rugged housing is depth compensated and should give you many years of dependable use with proper care. A black compass card with luminous heading markers allows you to maintain a course heading, even in the worst visibility for up to eight hours.

Illuminating the compass can be achieved by shining a bright light or UV light on the compass card for several minutes. This excites the luminous properties of the card and allows you to visually see the compass at night or in poor visibility conditions for up to eight hours. The longer you excite the card with light, the longer it glows underwater.

The TAC100-2 Underwater Compass requires very little care. However it is a precision instrument and should be treated as such. The entire compass should be periodically removed from the TAC200-1 Board and rinsed with clear water and dried with a soft cloth to maintain clear vision. If air bubbles appear in the dome or any other problems should occur, contact RJE International, Inc. for service.

PREFACE

PROPERTY

The information, descriptions, photos, and illustrations in this manual are the property of RJE International, Inc. Materials may not be reproduced or disseminated without prior written consent of RJE International, Inc.

WARRANTY

RJE International, Inc. warrants the DG100 to be free of defects in material and workmanship for a period of one year from date of delivery to the original purchaser. Obligation under this warranty is limited to repair or, at the sole discretion of RJE International, replacement of any product returned to our facility or authorized distributor. All products shall be shipped to **RJE FREIGHT PREPAID** and shall be returned to customer **FREIGHT COLLECT**. Equipment may not be returned without prior authorization which must be requested in writing, email or phone call. Upon authorization a Case Number will be issued. The Case Number must appear on the outside of the shipment, as well as, in all pertaining correspondence. Shipments received without a Case number will be refused by RJE International. This warranty does not apply in cases where the product malfunctions as a result of mishandling or improper use.

LIABILITY

RJE International, Inc. assumes no liability for damages, losses, or cost incurred consequentially through operation or malfunction of any RJE International, Inc. product.

CHANGES

RJE International Inc. reserves the right to make changes in design or specifications at any time without any obligation to modify previous units. This manual is provided for information and reference purpose only and is subject to change without notice.

We always welcome our customers feedback and product improvement ideas. If you have any questions or comments, contact us at:

INTRODUCTION

The TAC-100D Diver Navigation Board was developed and is used by divers for accurately navigating underwater. Highly reliable and rugged, the TAC-100D consist of three major components: a rugged high impact plastic board (p/n TAC100-1), a large underwater compass (p/n TAC100-2), a digital depth gauge with timer (DG100). The TAC-100D is supplied in a padded carrying case (p/n TAC100-4).

The TAC-100D allows the diver to monitor depth, direction and leg time. By using this information, a diver can plot and follow a planned course during a dive with a high level of reliability.

DG100 Digital
Depth Gage
with Timer

TAC100-2
Compass

TAC100-1
Dive Board

TAC-100D Diver Navigation Board
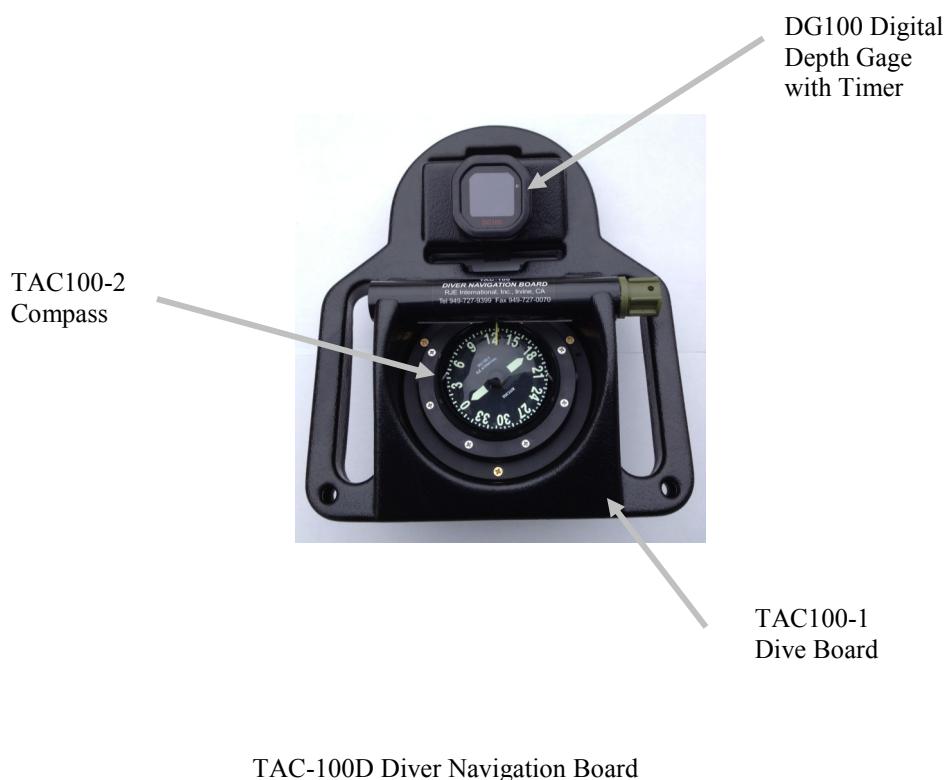
USING THE TAC-100D DIVER NAVIGATION BOARD

Navigating with the TAC-100D is simple once you understand the principle "elapsed time" as a method of underwater navigation. The key to using "elapsed time" is knowing how long it takes to swim a known distance in a set frame of time. For example, if you consistently travel 30 ft.(10M) in 20 seconds, then you can estimate the distance you travel by timing the length of your swim over a given compass heading. To be fairly accurate, you must set this "benchmark" by swimming at a normal relaxed pace.

Once you have established this "benchmark", the TAC-100D allows you to plot and follow a predetermined pattern or course for your dive instead of randomly swimming around. To understand how to plot a course, you must understand how the components of the TAC –100D work together.

Depth and time are tracked on the DG100 depth gauge and timer. Course heading is monitored by the large underwater compass mounted in the center of the TAC100-1 navigation board. The compasscard has white luminous digits on a black background for better contrast in poor visibility, and the three compass rose points, North, East, and West, are highlighted.

Now let's plot a dive to see how the TAC-100D really works. We are able to cover a distance of 30 ft. (10m) in 20 seconds, which is our benchmark. Using this benchmark, let's plot a dive to a reef that is located north of the shoreline, 270 ft.(82m) offshore in 40 ft. (12m) of water. In planning this dive, we will explore the reef in a westerly direction and then return to our entry point.

For the first leg of the dive we will plot a course along a heading of 0° north for 3 minutes. We should cover a distance of 270 ft. and be on the reef. Now for leg 2, we will plot a course on a heading of 270° west for 10 minutes. This means we cover a distance of 900 ft. while exploring the reef. At the end of leg 2, it's time to start planning our return to the entry point. But first, let's plan on exploiting the area between the reef and shoreline. To do this, we plot our next course heading for leg 3 on a heading of 180° south for 1 minute. This means we will transverse 90 ft (27m) along the bottom toward the shore. Here, we will turn to a heading of 90° east for 10 minutes which places us back in the middle of leg 1. Now, all we do is turn to a heading of 180° south and head for shore.

BATTERY CHARGING

To charge the DG100, remove the battery charge cap from the back of the unit by turning it counter clockwise until the slots line up. Use a flat object to lift the cap from the body of the DG100. Plug USB connector from DG100 Battery Charger (DG100-01) into the back of the DG100 and then plug the charger into a 110/220 volt outlet. Note that the battery health indicator will start to flash. The DG100 will charge to 100% in 12 hours and charge to 90% in 2 to 3 hours. In addition, the DG100 can be charged using a standard USB to mini-B cable connected to a standard PC. Once unit is finished charging remove USB Connector and re-install USB cap. Ensure that the cap is properly install to prevent fooding the unit. **Note: DG100 will also display warning to re-insert USB cap before diving. To clear warning, short press A-Button.**

Remove cap with flat object

Insert USB connector into charging receptacle

CHANGING DEPTH SCALE AND ALARM LEVEL

When the DG100 is connected to the battery charger, the unit can be toggled from displaying depth in FEET or METERS by long pressing the B-Button. When the DG100 displays FSW, the unit is measuring depth in feet while displaying MSW indicates meters. At this point DG100 will display FSW or MSW with flashing "MAX" on the OLED display and "0" for depth.

At this point, the operator needs to set "MAX" depth indicator levels. Short press the B-Button to set the MAX Depth Alarm indicator by 10ft increments up to 200ft(Implerial). In metric, the increments are 3M up to 60M. Short pressing A-Button will lock MAX depth limit.

Once unit is finished has been set, remove the battery charger and re-install USB cap. Ensure that the cap is properly install to prevent flooding the unit. **Note: DG100 will also display warning to re-insert USB cap before diving. To clear warning, short press A-Button.**

DG100 Digital Depth Gauge and Timer

The DG100 is a digital depth gauge that measures and displays depth accurately from 0 to 330Ft (0-100m). Using a state-of-the-art pressure transducer, the DG100 depth resolution is 0.1ft (0.1m) and is altitude compensated to 6,000ft (1,828m).

The DG100 also tracks the dive time automatically once activated, and will store the total dive time upon surfacing. In addition to tacking the total dive time, the DG100 also tracks leg times. The leg time functions are independent of the dive time. Upon surfacing, the DG100 switches to "Surface Mode" and the surface timer activates. While in "Surface Mode" the DG100 memory can be accessed and allows the diver to recall their deepest excursion and display it. When recalling the max depth, the total dive time is also displayed.

- Display and Controls

Stopwatch Indicator

Battery Level

00:00:00

Depth Warning Indicator

Leg/Dive/Surface Timer

MAX FSW

0.0

Metric/Imperial Indicator

Depth

DG100
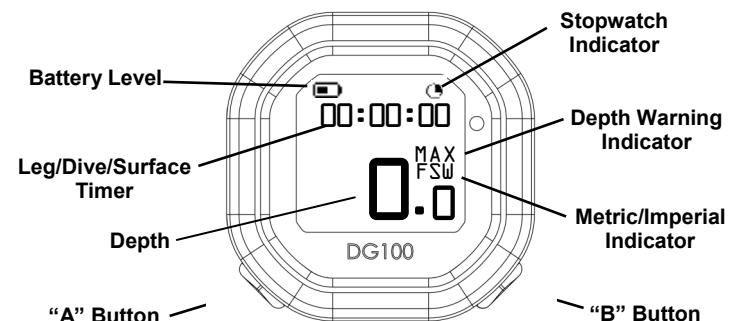
"A" Button

"B" Button

Depth readings are provided to the diver through a large Red OLED display on the bottom of the screen. Both dive and leg times are displayed at the top of the screen. The DG100 buttons supply access to these functions. Using an ambient light sensor, that is built-in to the screen, the DG100 automatically adjust brightness of the OLED display. All functions of the DG100 are controlled through buttons on each side of the display. Buttons are operated in two modes Short Press or Long Press. In Short Press operation it is the release of the button that performs the desired function, this is intentional so as to avoid accidental button activation. A Long Press is defined as lasting 2 seconds or more.

DISPLAY STATUS INDICATOR:
MAX = Maximum Depth
FSW = Feet of Sea Water
MSW = Meters of Sea Water

HIBERNATION MODE

Once the DG100 is on the surface for 10 minutes, the unit enters "Hibernation Mode" and shuts down. While in Surface Mode, the unit can be put into "Hibernation Mode" by long pressing the A-Button. Please note the unit is not powered off but hibernating. Always check battery level before a dive. To wake unit and enter "surface mode", short press either the A or B button.

SURFACE MODE

To enter "Surface Mode", short press either the A or B button. Once activated the unit will briefly display the serial number and battery level and then the depth indicator will be displayed. While in "Surface Mode", press and hold the B-Button the unit will display the maximum depth and duration of the last dive performed. You can also toggle to the Stopwatch Mode by short pressing the A-Button and B-Button Together. To put the DG100 back into "Hibernation Mode" long press the A-Button.

MAINTENANCE AND CHANGING SETTINGS

Although built for the rigors of underwater use, the DG100 is a precision tool and should be treated as such. Avoid violent bumps and drops that could effect the reliability of the gauge. The DG100 is completely sealed and there is very little maintenance involved with the unit. Do not exceed the maximum depth of 330ft (100M) as this may damage the unit.

BATTERY AND BATTERY HEATH INDICATOR

The DG100 comes with a rechargeable battery that provides up to 20 hours of continuous use. The battery, in the DG100, can be recharged over 300 times before having to replace the unit.

Upon activation, the battery health indicator is located on the top-right of the display and looks like a battery. When fully charger the battery is full (see below). It is recommended that you check the battery level before every dive.
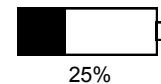
100%   50%   25%

ACTIVATION

The DG100 will enter "Dive Mode" automatically once immersed in water to a depth of approximately 3 feet (1 meter).

DIVE OPERATION

Once activated, the DG-100 will display depth and track the length of the dive. While in "Dive Mode", it is not possible to hibernate the unit, the DG100 will continue to operate.

MONITORING DEPTH

The DG100 will continually display the depth in real time to 330ft (100m). During the dive, the operator can toggle between the current dive and the maximum depth obtained during the dive by long pressing the B-Button.
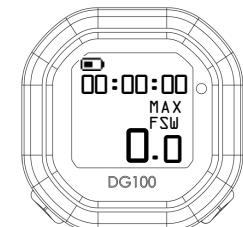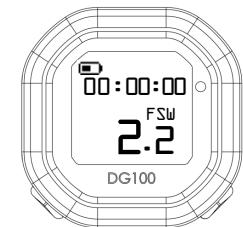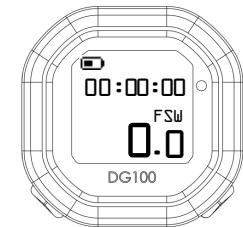
MAX DEPTH INDICATOR

The "MAX" Status will illuminate once the DG100 exceeds programed "MAX" depth. It will remain on and will be reset by attaching DG100 to a USB port or re-entering dive mode from surface mode. Note: The default setting for "MAX" depth Is 30ft (9m).

DIVE AND SURFACE TIMEER

Once the DG100 is activated underwater a timer starts to monitor the length of the dive. The DG100 will stop monitoring the length of the dive once the unit is less then 3ft (1m) from the surface for more then 60 seconds. Once the unit has exceeded 60 seconds near the surface, the DG100 starts a timer that monitors surface time for up to 99 hours. The surface interval time will reset on the next dive, once the unit exceeds a depth of 3ft(1m).

STOPWATCH MODE

While in "Dive Mode", pressing the A-Button and B-Button together switches the unit from "Dive or Surface Mode" to "Stopwatch Mode". This mode allows the operator to start a timer, pause it, restart that leg, and reset to zero. Once started, short press the B-Button to start and pause the timer. Short press A-Button to zero the timer. Pressing the A-Button and B-Button together switches the unit back to "Dive or Surface Mode".